June 15, 1926. 1,589,066

W. J. GIBBONS

CONTACT DEVICE FOR ELECTRIC SWITCHES

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Fig. 1.

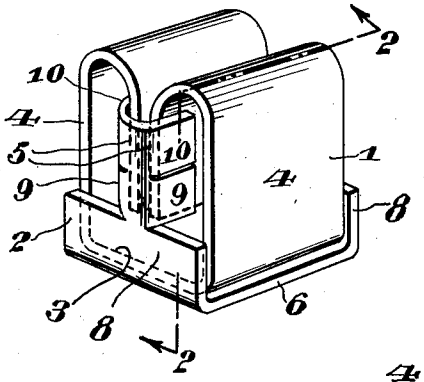


Fig. 2.

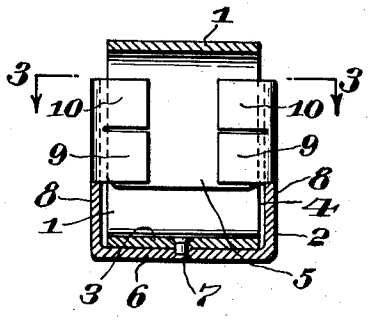


Fig. 3.

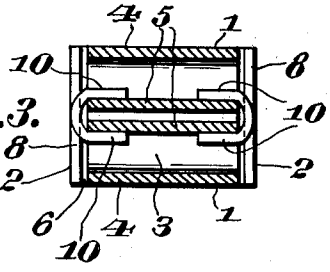


Fig. 4.

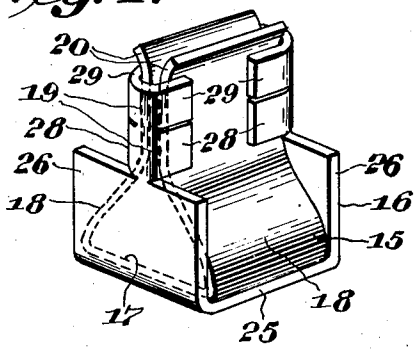


Fig. 5.

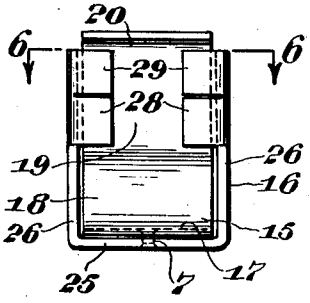
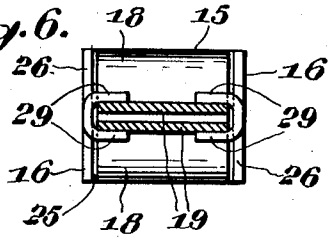


Fig. 6.



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CONTACT DEVICE FOR ELECTRIC SWITCHES

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Fig. 7.

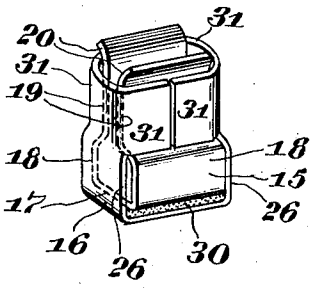


Fig. 8.

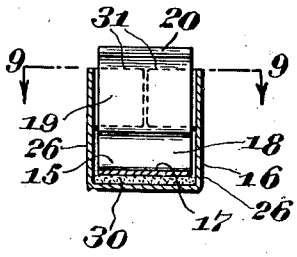


Fig. 9.

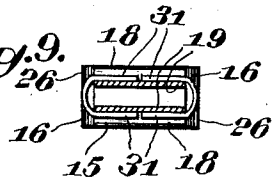


Fig. 11.

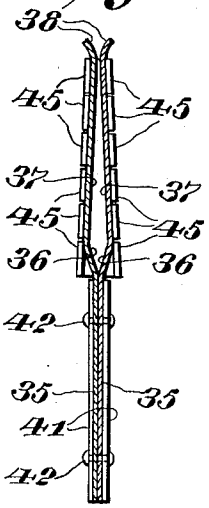


Fig. 10.

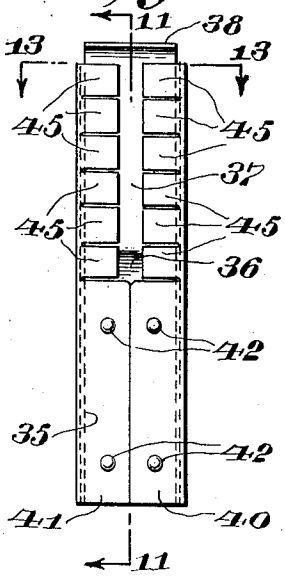


Fig. 12.

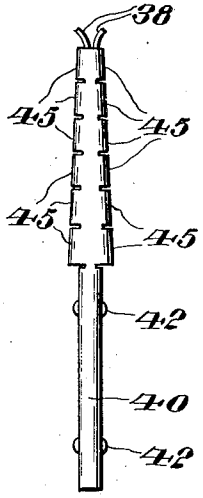
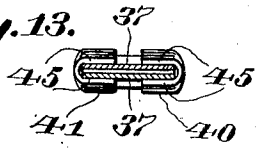


Fig. 13.



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Patented June 15, 1926. 1,589,066

UNITED STATES PATENT OFFICE.

WILLIAM J. GIBBONS, OF PHILADELPHIA, PENNSYLVANIA.

CONTACT DEVICE FOR ELECTRIC SWITCHES.

Application filed February 2, 1922. Serial No. 533,592.

My invention relates to contact devices for electric switches, and it has for its object broadly to provide novel means whereby when the contact members of a switch are in engaged or interlocked relation the adjacent opposing surfaces thereof shall be in continuous contact throughout their entire length. A further object of the invention is to provide means to prevent unnecessary sparking at the moment of disconnection of the parts of the switch.

Without endeavoring to point out at this point all of the objects of the invention, I shall proceed to a description of the same, and in order that the invention may be more readily understood and its advantages fully appreciated, reference will be made to the accompanying drawings in which certain forms of devices embodying the principle of the invention are shown.

It will be understood that various changes may be made in the details of construction within the scope of the claims without departing from the said invention.

In the drawings:

Fig. 1 is a view in perspective of a contact device for electric switches embodying my invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a perspective view of a modified construction of switch device embodying my invention;

Fig. 5 is a view in side elevation of the switches in Fig. 4;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a perspective view showing an additional slightly modified construction of switch device embodying the invention;

Fig. 8 is a central vertical sectional view taken in a plane intermediate and parallel with the opposite sides of the switch device shown in Fig. 7;

Fig. 9 is a transverse sectional view taken on the line 9—9 of Fig. 8;

Fig. 10 is a view in side elevation of still another modified construction of contact device embodying the invention;

Fig. 11 is a longitudinal view taken on the line 11—11 of Fig. 10;

Fig. 12 is a view in edge elevation of the contact device shown in Figs. 10 and 11; and

Fig. 13 is a transverse sectional view taken on the line 13—13 of Fig. 10.

Referring to Figs. 1 to 3 of the drawings, 1 designates an inner spring contact member and 2 an outer supplemental controlling spring member.

The member 1 comprises a base portion 3 and upwardly extending side portions 4 arranged in general parallel relation with respect to each other and terminating at their upper ends in downwardly extending oppositely disposed portions 5 with which the co-operating plug member (not shown) of the switch device is adapted to co-operate.

The base portion 3 rests upon an intermediate base portion 6 of the member 2, and may be secured thereto by any suitable means, as by a rivet 7. The member 2 also comprises oppositely disposed upwardly extending end portions 8, which are situated adjacent or in contact with the lower portions of the opposite edges of the sides 4 of the member 1. The said opposite end portions 8 are provided with slits, which extend inwardly from the opposite edges thereof toward each other so as to form tongues 9 and 10, which tongues are arranged in pairs as shown and are situated on opposite sides of the opposite edge portions of the downwardly extending portions 5 of the member 1.

It will be seen that the inwardly extending and oppositely disposed tongues 9 and 10 are situated adjacent to or in contact with the outer sides of the depending portions 5 of the member 1 and tend to retain the same in parallel relation to each other upon the insertion of a co-operating contact plug employed to make and break an electric circuit and also tends to prevent deformation of the construction as a result of continued usage. By thus holding the depending portions 5 in substantially parallel relation with respect to each other as described, it will be seen that upon removal of a contact plug from between the said parts 5 the separation

when it takes place is effected instantly and not gradually, thereby preventing sparking between the said plug member and the said spring contact part of the switch.

Referring now to Figs. 4, 5 and 6, 15 designates an inner spring plate contact member and 16 an outer spring plate controlling member. The member 15 comprises a base portion 17 and oppositely disposed upwardly extending sides, the lower portions 18 of which converge as shown, while the intermediate portions 19 are arranged in substantially parallel relation with respect to each other. The extreme upper ends of the said opposite sides diverge or flare outwardly as indicated at 20.

The member 16 is provided with a base portion 25 upon which the base 17 rests, and to which it is secured by any suitable means, as by a rivet 7, and with oppositely disposed upwardly extending end portions 26, which are situated in contact with or in adjacent relation to the opposite edges of the sides of member 15.

The upper portions of the opposite end parts 26 are provided with slits which extend inwardly from the opposite edges thereof to form tongues 28 and 29 which are bent inwardly and are situated upon opposite sides of the substantially parallel portions 19 of the opposite sides of the member 15. These tongues 28 and 29 are arranged in pairs as shown.

The construction shown in Figs. 7, 8 and 9 is quite similar to that shown in Figs. 4, 5 and 6, the parts 15 and 16 being substantially the same. The member 15 in said Figs. 7, 8 and 9 is provided with portions 18, 19 and 20 which are substantially the same as the portions correspondingly numbered in Figs. 4, 5 and 6, while the part 16 is provided with opposite end portions 26 corresponding to the end portions similarly numbered in Figs. 4, 5 and 6. In the said Figs. 7, 8 and 9, however, the parts 15 and 16 are secured together by soldering as indicated at 30 and the opposite end portions 26 of the member 16 are respectively provided with one pair of tongues 31 only instead of two pairs as shown in the previous figures of the drawing.

In the construction as shown in Figs. 11 to 13 inclusive, I have provided a spring contact device comprising two inner plate members 35. The lower half portions of said plates are flat and are arranged in contact with each other as shown. These plates 35 diverge as indicated at 36 for a short distance after which they normally converge as indicated at 37 to points adjacent their outer ends. The extreme upper ends of the said plates are flared outwardly as indicated at 38. The contact plug (not shown) which is adapted to co-operate with the contact device shown is adapted to be inserted into the upper end of the space between converging portions 37 of the said plates. In order to cause the said converging portions 37 to contact with the opposite sides of the plug at all points thereof, I have provided the outer holding and controlling members 40 and 41, each of which consists of a plate bent so that it is of U-shape in cross-section. The opposite edges of the plates 35 are inclosed within these U-shaped members. The lower portions of the said U-shaped members fit closely against the opposite sides of the lower portions of the plates 35 and are secured thereto and to each other by means of rivets 42.

The opposite sides of the upper portions of each of the members 40 and 41 are spaced from each other a distance as indicated and are slightly tapered as shown. The opposite sides of the upper portions of each of these members are slit so as to form tongues 45. These tongues are arranged in pairs and are situated upon the opposite sides of the diverging and converging portions at 36 and 37 of the spring plate members 35.

Upon the insertion of a contact plug into the space between the converging portions 37 of the plate 35, the upper ends thereof will be separated or pushed apart in opposition to their own spring action and also in opposition to pressure and resistance offered by the tongues 45.

In all of the constructions illustrated the tongues referred to and comprised in the several constructions co-operate with the spring portions of the inner plate members to prevent too great a separation of the latter. The presence of these outside controlling and co-operating tongues causes the contact portions of the inner contact members to remain in close and uninterrupted contact with the contact plug inserted in the switch until the very moment of final separation of the said plug from the said spring contact member of the switch. Upon removal of the plug from the switch the separation takes place instantaneously, whereby sparking is prevented or reduced to an absolute minimum.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is;—

1. In a spring contact device for electric switches, the combination of an inner spring plate member having base and side portions, the said side portions terminating in contact portions arranged in general parallel relation with respect to each other and an outer plate member having a base portion extending transversely of the base portion of the inner member and having its opposite end portions extending upwardly in adjacent relation to the opposite edges of the side portions of said inner member and terminating in means at their upper ends which are situated on opposite sides of

the said contact portions and adapted to contact therewith upon the insertion of a plug, substantially as and for the purpose described.

2. In a spring contact device for electric switches, the combination of a plate member having base and side portions the latter extending uwardly from the opposite ends of said base and terminating in contact portions between which a contact plug is adapted to be inserted, a member having a base portion connected with the base portion of the said first named member and extending transversely thereof, and the said second named member being provided with upwardly projecting portions at the opposite ends of its base in adjacent relation to the opposite edges of the side portions, said upwardly projecting portions being provided with inwardly extending tongues arranged in pairs, the tongues of the respective pairs being situated upon opposite sides of the said contact portions and adapted to contact therewith upon the insertion of a plug, and means for securing the said members together, substantially as described.

3. In a spring contact device for electric switches, the combination of an inner spring plate member having a base portion and side portions extending upwardly from the opposite ends of said base portion, said side portions having contact parts spaced from each other and arranged in general parallel relation between which a contact plug is adapted to be inserted and an outer plate member arranged at right angles to the said inner plate member and having a base portion situated underneath the base portion of the said inner member, and having its opposite ends extending upwardly in adjacent relation to the opposite edges of the upwardly extending sides of the said inner member and the said opposite end portions of the outer member being provided with slits to form tongues, which tongues are extended inwardly toward each other and are situated upon opposite sides of and in adjacent relation to the outer surfaces of the contact parts of the said inner member, substantially as described.

4. In a spring contact device for electric switches, the combination of an inner spring plate member having a base portion and side portions extending upwardly from the opposite ends of said base portion, said side portions terminating in contact parts, which are arranged in general parallel relation with respect to each other and between which a contact plug is adapted to be inserted, an outer plate arranged at right angles to said inner plate member and having a base portion situated underneath the base portion of the said inner member and having opposite end portions extending upwardly in adjacent relation to the opposite edges of the upwardly extending side portions of said inner member and the said opposite end portions being provided with slits extending inwardly from the opposite edges thereof to form tongues, which tongues extend inwardly in pairs and in spaced relation to each other and occupy positions upon opposite sides of the contact parts of the said inner member, and means for securing the said inner and outer members together, substantially as described.

5. A spring contact device for electric switches comprising plate spring contact parts in spaced relation to each other and two sets of spring acting tongues situated in operative relation to the opposite edges of the plate spring contact parts, the said tongues extending inwardly toward each other and those of each set being situated upon opposite sides of the opposite edge portions of the said plate spring contact parts and adapted to contact therewith upon the insertion of a plug, substantially as described.

In testimony that I claim the foregoing as my invention, I have hereunto subscribed my name this 31st day of January, A. D., 1922.

WILLIAM J. GIBBONS.